

# WEST Search History

Hide Items

Restore

Clear

Cancel

DATE: Wednesday, April 28, 2004

Hide?	Set Name	Query	Hit Count
		<i>DB=USPT; PLUR=YES; OP=ADJ</i>	
<input type="checkbox"/>	L6	L5 and web and server	8
<input type="checkbox"/>	L5	(search adj2 request\$) same equivalent	24
<input type="checkbox"/>	L4	L3 and equivalence\$	10
<input type="checkbox"/>	L3	client and web server and product\$ and L2	18
<input type="checkbox"/>	L2	compar\$ same L1	175
<input type="checkbox"/>	L1	search adj2 request\$	2134

END OF SEARCH HISTORY

First Hit   Fwd Refs

Generate Collection

Print

L3: Entry 4 of 18

File: USPT

Jul 22, 2003

DOCUMENT-IDENTIFIER: US 6598040 B1

TITLE: Method and system for processing electronic search expressions

Abstract Text (1):

The present invention relates to a method, system, and program product for utilizing metawords to find electronic documents. According to the method of the present invention, a user specifies an initial search expression that includes at least one metaword. It is determined that the at least one metaword corresponds to a boolean expression, and, in response, an expanded search expression is generated. The expanded search expression includes the boolean expression in lieu of the at least one metaword, such that the expanded search expression is utilized in lieu of the initial search expression to find the electronic documents. In an illustrative embodiment, the determining step includes the step of determining that one or more terms and a count qualifier are associated with the at least one metaword. The count qualifier specifies a threshold number of occurrences of the one or more terms within a single electronic document.

Brief Summary Text (5):

The World Wide Web (i.e., the Web) denotes a vast set of interlinked documents (i.e., Web pages) residing on various data processing systems around the globe. In recent years, the Web has experienced rapid growth, to the point that the Web now contains millions of documents. The data processing systems that serve up these documents on request are called servers, and when a data processing system is utilized to retrieve a document from a server, the retrieving data processing system is considered a client.

Brief Summary Text (13):

The present invention relates to a method, system, and program product for utilizing metawords to find electronic documents. According to the method of the present invention, a user specifies an initial search expression that includes at least one metaword. It is determined that the at least one metaword corresponds to a boolean expression, and, in response, an expanded search expression is generated. The expanded search expression includes the boolean expression in lieu of the at least one metaword, such that the expanded search expression is utilized in lieu of the initial search expression to find the electronic documents.

Detailed Description Text (2):

With reference now to the figures, and in particular with reference to FIG. 1, there is depicted an exemplary collaborative data processing environment or network 10 according to the present invention. Network 10 includes two clients 12A and 12B and two servers 20 and 22. Clients 12A and 12B obtain connections to server 20 via an intermediate data processing system, such as an Internet service provider ("ISP") 24. Also, clients 12A and 12B utilize the TCP/IP and HTTP protocols to communicate with servers 20 and 22 over communications media 26 (which may include such media as twisted-pair cables, coaxial cables, telephone lines, optical fibers, microwave links, and/or radio links).

Detailed Description Text (3):

Preferably, network 10 is a portion of the Internet, with clients 12A and 12B and servers 20 and 22 being connected to, or capable of connecting with, many

additional clients and servers. As described in greater detail below, in the illustrative embodiment server 22 contains publicly accessible Web pages and server 20 includes a publicly accessible search engine. Also, each of clients 12A and 12B includes a Web browser with facilities for accepting and storing so called "cookies" from, and returning cookies to, Web servers (such as server 20).

Detailed Description Text (4):

As recognized by those of ordinary skill in the art, a cookie is a data item relating to a Web page that a Web server causes to be stored on a client. In accordance with the HTTP protocol, the cookie is automatically returned to the Web server by the client whenever the client subsequently accesses the Universal Resource Locator (URL) corresponding to that Web page. Servers commonly utilize cookies to identify clients, for example so that repeat users may be recognized.

Detailed Description Text (5):

Referring now to FIG. 2, there is illustrated a layer diagram of the software of server 20. At the lowest level of the diagram is the operating system 60, which manages the operations of server 20 by performing duties such as resource allocation, task management, and error detection. Operating system 60 also provides tools for managing communications between server 20 and remote data processing systems (such as clients 12A and 12B). Included in operating system 60 is a kernel 62 that manages the memory, files, and peripheral devices of server 20. The lowest level also includes device drivers, such as a keyboard driver 64, a mouse driver 66, a network driver 68, and a file system driver 70, which kernel 62 utilizes to manage input from and output to peripheral devices, communication ports, and storage media (such as disk drive 72). At the intermediate level is an application program interface (API) 50, through which application programs 30 request services from operating system 60. The highest level of the diagram contains the application programs 30, which include the search engine 40.

Detailed Description Text (7):

In addition, search engine 40 includes a comparator 84 that determines which documents match the expanded search expression. In the illustrative embodiment that determination is made by reference to a database 90, which associates the addresses of numerous Web pages (including Web pages stored on server 22) with the content of those Web pages. For instance, database 90 may contain summaries of, excerpts from, and/or keywords associated with those Web pages. Preferably, database 90 includes this kind of information for millions of Web pages on hundreds or thousands of Web servers, and comparator 84 preferably utilizes the services of a database engine 92 to obtain the required information from database 90. In the illustrative embodiment database 90 is stored on disk drive 72; however, database 90 could as well be stored entirely or partially in CD-ROM drives, in memory, or on any other ~~appropriate medium or combinations of media (including storage media of one or more~~ additional data processing system). Once the matching documents are identified, a hit list identifying those documents is returned to the user by user interface module 80.

Detailed Description Text (8):

With reference to FIG. 3, there is depicted an illustrative user interface 100 with support for metaword searches according to the present invention. In the illustrative embodiment, user interface 100 is a Web page that is built dynamically by search engine 40 and returned to clients in response to user requests referencing the home URL of search engine 40. As illustrated, user interface 100 includes a search field 110 into which the user may type a search expression and a submit button 112 for causing the client to transmit the search expression to search engine 40.

Detailed Description Text (11):

When generated for a returning user (i.e., a user that has accessed search engine 40 before), the contents of metaword list 120 and metaword definition list 122 may

be modified from the default in accordance with any changes recorded by the returning user during previous sessions. User interface 100 allows users to record such changes through utilization of a name field 130 and a definition field 132 (both of which accept forms of input including typing and "pasting"), and an ADD button 136 for recording the entered data. An example of a user-defined metaword in FIG. 3 is the metaword ACTION\_HEROES. According to the illustrative embodiment, user-defined metawords are stored in the clients as cookies. In alternative embodiments, however, user-defined metawords could be saved on a server, for example as part of a user profile.

Detailed Description Text (18):

Referring now to FIG. 4, there is illustrated a high-level logical flowchart of an exemplary process, in accordance with the present invention, for supporting metaword searches. The process begins at block 140 with search engine 40 executing in server 20. The process then passes to block 142, which illustrates server 20 receiving a request for the home page of search engine 40 from client 12A. Search engine 40 then examines any cookies included in the request from client 12A to determine whether the request is coming from a new user, as illustrated at block 144. If the user is a new user, user interface module 80 of search engine 40 builds a user interface that includes the default metaword list 120, as shown at block 146. Otherwise, as depicted at blocks 148 and 150, respectively, search engine first retrieves the current user's saved metawords and then builds a user interface with a customized metaword list 120 (i.e., a metaword list that includes any user-defined metawords recorded by the current user). In the illustrative embodiment, search engine 40 retrieves the user-defined metawords by extracting them from one or more cookies that accompanied the originating request (i.e., the request for the home page of search engine 40).

Detailed Description Text (19):

Once the user interface has been built, search engine 40 transmits the user interface to client 12A as a Web page to be displayed by a Web browser, as illustrated at block 152. The user then interacts with the user interface at client 12A to either submit a search expression or record a new metaword, as described above with reference to FIG. 3. As depicted at block 160, search engine 40 then determines whether a search request has been received from client 12A. If so, search engine 40 utilizes parser 82 to interpret the search request, in accordance with the syntax described above, and utilizes comparator 84 and database engine 92 to process the search request and generate a resulting hit list, as depicted at block 162. In particular, if the initial search expression includes one or more metawords, parser 82 generates an expanded search expression in which those metawords are replaced by the corresponding search terms, boolean functions, and/or boolean operators, and the expanded search expression is then passed to comparator 84.

Detailed Description Text (20):

However, referring again to block 160, if it is determined that no search request has been received, search engine 40 then determines whether a request to add a new metaword has been received from client 12A, as illustrated at block 164. If an add request has been received, search engine 40 causes the new metaword to be stored, as shown at block 166, preferably by transmitting an appropriate metaword definition to client 12A to be stored as a cookie.

Detailed Description Text (21):

As illustrated at block 170, after the search request or add request has been processed, search engine 40 builds a new user interface screen including the hit list and/or an updated metaword list, as appropriate. The process of receiving user requests is then repeated, beginning with the new user interface being returned to client 12A, as illustrated at block 152.

Detailed Description Text (22):

However, referring again to block 164, if no add request was received, search engine 40 determines whether the process should be terminated (for instance in response to a determination that the connection between client 12A and server 20 has been terminated), as depicted at block 182. If so, the process ends, as shown at block 182. Otherwise, the process returns to block 160, and search engine 40 continues to handle search and add requests.

Detailed Description Text (28):

Also, the metawords and their definitions are stored as cookies in a client in the illustrative embodiment. However, the present invention also includes alternative embodiments in which recording constructs other than cookies are utilized to store some or all of the metawords. For example, the default metawords and/or their definitions may be stored on the server, with only the user-defined metawords stored on the client. Additionally, the present invention includes alternative embodiments in which the client rather than the server expands (or parses) the search expressions by replacing metawords with corresponding boolean functions, etc. Such a client would send the expanded search expression to the server for processing by the comparator. Additional alternative embodiments include search engines with facilities for storing user profiles that a user may activate by entering a userid and password, rather than the user profile being determined solely by reference to client cookies.

Detailed Description Text (32):

Also, although aspects of the present invention have been described with respect to a computer system executing software that directs the functions of the present invention, it should be understood that the present invention may alternatively be implemented as a program product for use with a data processing system. Programs defining the functions of the present invention can be delivered to a data processing system via a variety of signal-bearing media, which include, without limitation, non-rewritable storage media (e.g., CD-ROM), rewritable storage media (e.g., a floppy diskette or hard disk drive), and communication media, such as digital and analog networks. It should be understood, therefore, that such signal-bearing media, when carrying or encoding computer readable instructions that direct the functions of the present invention, represent alternative embodiments of the present invention.

Detailed Description Paragraph Table (1):

```
<metaset> <someof name="FORSALE" some="5" min="3"> <item>price</item>
<item>buy</item> <item>shopping</item> <item>cart</item> <item>purchase</item>
<item>VISA</item> <item>shipping</item> <item>products</item> <item>bargain</item>
<item repeat="3">$</item> <item>account</item> <item>store</item> </someof> <someof
name="ACTION_HEROES some="1"> <item>Tarzan</item> <item>Batman</item>
<item>Superman</item> </someof> <allof name="ACTION_HERO_READING"> <group
ref="ACTION_HEROES"/> <group ref="FORSALE" invert="yes"/> </allof> <patternof
name="CREDIT_CARD" repeat="3" words="1000"> <item>credit card number</item>
</patternof> <patternof name="CREDIT_CARD_DATA" words="200"> <item>credit
card</item> <item>expiration date</item> </patternof> <noneof
name="FAMILY_CONTENTS"> <item>XXX</item> : : : <item>nude</item> </noneof>
</metaset>
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CLAIMS:

9. A program product for processing a search expression for finding electronic documents, said program product comprising a plurality of computer executable instructions embodied in signal bearing media, wherein said instructions cause a computer to perform the steps of: providing a search interface that allows a user to define an initial search expression; automatically presenting at least one metaword within said search interface, such that said at least one metaword is automatically added to said initial search expression in response to user selection of said at least one metaword; receiving said initial search expression that

includes at least one selected metaword; in response to receiving said initial search expression, determining that said at least one selected metaword corresponds to a boolean expression; and in response to determining that said at least one selected metaword corresponds to a boolean expression, generating an expanded search expression that includes said boolean expression in lieu of said at least one selected metaword, such that said expanded search expression is utilized in lieu of said initial search expression to find said electronic documents.

10. The program product of claim 9, wherein: said step of determining that said at least one metaword corresponds to a boolean expression comprises determining that said at least one metaword corresponds to a list of two or more terms; and said step of generating an expanded search expression comprises including said two or more terms in said expanded search expression in lieu of said at least one metaword.

11. The program product of claim 9, wherein: said step of determining that said at least one metaword corresponds to a boolean expression comprises determining that said at least one metaword corresponds to one or more terms and a count qualifier, wherein said count qualifier specifies a threshold number of occurrences of said one or more terms within a single electronic document; and said step of generating an expanded search expression comprises including said one or more terms and said count qualifier in said expanded search expression in lieu of said metaword.

12. The program product of claim 11, wherein: said step of generating an expanded search expression comprises including a someof function in said expanded search expression in lieu of said metaword, wherein said someof function includes said one or more terms and said count qualifier as required parameters and a diversity qualifier as an optional parameter; and said program product further cause said computer to perform the step of utilizing said expanded search expression with said someof function to determine which of said electronic documents contain at least said threshold number of occurrences of said one or more terms while also containing at least as many different terms among said one or more terms as required by said diversity parameter.

13. The program product of claim 9, wherein: said step of determining that said at least one metaword corresponds to a boolean expression comprises determining that said at least one metaword corresponds to a patternof function that includes one or more terms and one or more term qualifiers; said step of generating an expanded search expression comprises including said patternof function in said expanded search expression in lieu of said metaword; and said program product further cause said computer to perform the step of utilizing said expanded search expression with said patternof function to find said electronic documents.

14. The program product of claim 13, wherein: said step of determining that said at least one metaword corresponds to a patternof function comprises determining that said at least one metaword corresponds to a patternof function that includes two or more terms and one or more term qualifiers, wherein at least one of said one or more term qualifiers specifies a placement of at least one of said two or more terms, relative to at least one other of said two or more terms; and said step of utilizing said expanded search expression comprises determining which of said electronic documents contain said two or more terms, with said at least one of said two or more terms having said specified placement.

15. The program product of claim 9, wherein said program product further cause said computer to perform the step of providing facilities that allow a user to define and store user-defined metawords.

16. The program product of claim 9, wherein said program product further cause said computer to perform the step of providing facilities for performing at least one of an import function and an export function for importing metaword definitions to a

search engine and exporting metaword definitions from a search engine,  
respectively.